



ANNUAL DRINKING WATER QUALITY REPORT FOR 2005

Lincoln Water System

2021 N. 27th
Lincoln, NE

Coleen J. Seng
Mayor

Karl Fredrickson
Director
Public Works
and Utilities

"...the quality of water produced and distributed shall meet or exceed all State and Federal standards governing such distribution."

*--excerpt, Statement of Purpose,
Lincoln Water System*



CITY OF LINCOLN
NEBRASKA

MAYOR COLEEN J. SENG

WHY THIS REPORT?

The Safe Drinking Water Act requires the Lincoln Water System to annually issue a report describing the quality of your drinking water. The purpose of this report is to raise your understanding of drinking water and awareness of the need to protect our drinking water sources. This report provides an overview of last year's water quality data collected from January 1 through December 31, 2005, including details about your sources of water, what it contains and how it compares to State and Federal standards.



Este formulario tiene información muy importante acerca del agua que usted bebe. Consiga que alguien se lo lea en español.

Đây là một tài liệu rất quan trọng về nước uống của chúng ta tại Lincoln, xin quý bạn dành thì giờ để tìm hiểu.

Tài liệu bằng tiếng Việt nam sẽ được in một ngày rất gần.

WHERE DOES OUR WATER COME FROM?

The sources of drinking water (both tap and bottled) include rivers, lakes, streams, ponds, reservoirs, springs and wells. Fortunately, our community receives its water from a self-replenishing source naturally high in quality. Lincoln's water comes from wells where the ground water is under the direct influence of surface water. In 2005, almost 14 billion gallons of water was pumped from these wells to serve the 238,800 people who use an average of 38 million gallons of water each day.

A source water assessment of our water supply has been completed by the Nebraska Department of Environmental Quality (NDEQ). The assessment includes maps, an inventory of potential contaminant sources and a determination of the vulnerability of the system to contamination. If you have any questions or would like to view the source water assessment, please call Jerry Obrist, 402-441-7571, to schedule an appointment.

Home Treatment Systems

Since all water supplied by the Lincoln Water System meets or exceeds every State and Federal safe drinking water standard, use of home water treatment devices to further improve quality is an individual option.

If you consider purchasing a home water treatment system, determine what the device will remove and the total cost of maintenance.

This report and other information about water are available on the City's Web site at:

lincoln.ne.gov



PURIFYING OUR WATER

Thanks to the natural filtration of the aquifer, nature has already done much of the work in enhancing the quality of Lincoln's water. Our water still contains iron and manganese, which pose no health concern but can stain clothing and plumbing fixtures. To remove these unwanted elements, water is pumped to the water treatment plants. The water flows through one of two processes before it is sent to your home or business.

1 The oldest process, highly effective since the 1930s, uses aeration, chlorination, detention and filtration. An exact amount of chlorine is added to the water in a large underground reservoir. The water is held in the reservoir for up to two hours. The iron and manganese form particles which are then trapped in the sand and gravel filters. The filters are cleaned every 120 hours using a process called backwashing.

2 The second process uses ozone technology. Ozone, an extremely strong oxidizer and disinfectant, reacts quickly with iron and manganese to form particles which are then removed in the filtration process.

The next step is vital to protecting the health of our community. Once the water passes through the filters, small but exact amounts of chlorine and ammonia are added. These chemicals combine to form a disinfectant called "chloramine", which prevents the growth of bacteria in the City's water pipes. Finally, fluoride is added to help prevent tooth decay.

REPEATED TESTING

Our commitment to your water quality does not end when the water leaves the treatment plant. Water samples from homes and businesses throughout the City are tested daily. We work closely with the Nebraska Department of Health and Human Services to test the water using approved EPA procedures.

We go a step farther. In addition to government-mandated testing for nearly 100 regulated compounds, our own laboratory technicians regularly test your water to make sure that the treatment process at the plant is working correctly.

MCL - Maximum Contaminant Level: The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG - Maximum Contaminant Level Goal:

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

N/A - Not applicable; **ND** - Not detected; **pCi/L** - pico Curies per liter (measure of radioactivity)

NTU - Nephelometric Turbidity Unit: A measure of the cloudiness of the water.

(a) Lincoln Peaking Wells produced 0.07% of the water consumed in 2005.

(b) Samples collected from homes and businesses in the distribution system.

(c) Water from the treatment plant does not contain lead or copper. Tests for lead and copper are collected from the customer's tap to ensure the substances have not been dissolved from the customer's service or interior piping system.

(d) Fluoride is added in treatment to bring the natural level of about 0.4 ppm to the optimum of 1.0 ppm.

(e) TT - Treatment Technique

* Action Level is the concentration of a contaminant which triggers treatment or another requirement which a water system must follow.



TEST RESULTS (2005 data unless otherwise noted)

Regulated Contaminants

Tested and Detected	Units	Regulatory Limit (MCL)	Goal (MCLG)	Ashland Plants	Lincoln (a)	Violation Yes/No	Likely Source(s)
Inorganic Contaminants							
Arsenic (7/02) - Lincoln (7/04) - Ashland	ppb	50	N/A	7.23	5.03	No	Erosion of natural deposits; runoff from orchards; runoff from glass and electronic production.
Barium (7/02) - Lincoln (7/04) - Ashland	ppb	2000	2000	98.8	101	No	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits.
Chromium (7/02) - Lincoln (7/04) - Ashland	ppb	100	100	ND	7.0	No	Discharge from steel and pulp mills; erosion of natural deposits.
Copper (c) - Lincoln (2004)	ppm	1.3*	1.3	N/A	0.693 (b)	No	Corrosion of household plumbing; erosion of natural deposits; leaching from wood preservatives.
Fluoride (d)	ppm	4	4	0.76	0.82 -1.1 (b)	No	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories.
Lead (c) - Lincoln (2004)	ppb	15*	0	N/A	4.393 (b)	No	Corrosion of household plumbing; erosion of natural deposits.
Nickel (05/03) - Lincoln (07/04) Ashland	ppb	100	N/A	ND	4.12	No	Erosion of natural deposits; leaching
Nitrate+Nitrite	ppm	10	10	0.84	3.9	No	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Organic Contaminants							
Atrazine	ppb	3	3	0.1	N/A	No	Runoff from herbicide used on row crops.
Radionuclides							
Gross Alpha (03/02) - Lincoln (01/03) - Ashland	pCi/L	15	0	3.0	2.8-10.2	No	Erosion of natural deposits.
Radium 226 & 228 combined							
(01/03) - Ashland	pCi/L	5	0	0.5		No	Erosion of natural deposits.
(05/03) - Lincoln	pCi/L	5	0		2.1	No	
Disinfection - By - Products							
Trihalomethanes (02/04) Ashland	ppb	80	N/A	2.06	3.93-21.7 (b)	No	By-product of drinking water chlorination.
Total Haloacetic Acid (HAA5)	ppb	60	N/A	N/A	2.41-8.31	No	By-product of drinking water chlorination.
Clarity							
Turbidity (e)	NTU	0.3	N/A	0.03-0.23	N/A	No	Soil runoff.
Microbiological							
Coliform Bacteria	Total Coliform Maximum Contaminant Level 5% of monthly samples are positive	Goal (MCLG) 0	Highest Monthly Positive Coliform Samples 2 of 213 (0.9%)	Total Positive E. Coli or Fecal Coliform Samples in 2005 1	Violation No	Fecal Coliform or E. Coli Maximum Contaminant Level Fecal Coliform or E. Coli MCL; A routine sample and a repeat sample are total coliform positive, and one is also fecal coliform or E. Coli positive.	Likely Source of Contamination Total Coliform Bacteria are naturally present in the environment. Fecal coliform and E. Coli are present in human and animal fecal waste.

Regulated Contaminants Tested and Not Detected:

Inorganic Chemicals: Antimony, Beryllium, Cadmium, Chromium, Cyanide, Mercury, Selenium, Thallium.
Volatile Organic Chemicals (VOC's): Benzene, Carbon Tetrachloride, o-Dichlorobenzene, p-Dichlorobenzene, 1,2-Dibromo-3-chloropropane, 1,2-Dichloroethane, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloropropane, Ethylbenzene, Chlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, Vinyl Chloride, Styrene, Tetrachloroethylene, Toluene, Xylenes (total).
Non-Volatile Synthetic Organic Chemicals including herbicides and pesticides: Alachlor, Benzo(a)pyrene, Chlordane, Dalapon, Di(2-ethylhexyl)adipate, Dinoseb, Di(2-ethylhexyl)phthalate, Diquat, 2,4-D, Endothall, Endrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Methoxychlor, Pentachlorophenol, Simazine, Toxaphene, 2,4,5-TP (Silvex).
Disinfection - By - Products: Bromate.

Unregulated Contaminants Tested

Although unregulated, Lincoln Water System monitors the following contaminants:

Tested and Detected	Units	Ashland Plants	Lincoln
Sulfate (7/04)	ppm	50	70
Dicamba - Lincoln (5/04)	ppb	-	3
Metolachlor - Ashland	ppb	0.2	-

Tested and Not Detected:

1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, 1,1-Dichloroethane, 1,1-Dichloropropene, 1,2,3-Trichloropropane, 1,3-Dichloropropane, cis-1,3-Dichloropropene, 2,2-Dichloropropane, Bromobenzene, Bromomethane, Chlorobenzene, Chloroethane, Chloromethane, Dibromomethane, m-Dichlorobenzene, m-Xylene, o-Chlorotoluene, o-Xylene, p-Chlorotoluene, p-Xylene, Aldrin, Butachlor, Dieldrin, Metolachlor, Metribuzin, Propachlor, Paraquat, Methyl-T-Butyl-Ether (MTBE), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,2-Dibromoethane, 2-Chlorotoluene, n-butylbenzene, sec-Butylbenzene, tert-Butylbenzene, n-Propylbenzene, p-Isopropyltoluene, trans-1,3-Dichloropropene, Promochloromethane, Chloropyrifos, Dichlorodifluoromethane, Hexachlorobutadiene, Naphthalene, Trichlorofluoromethane, Butylate, Cyanazine, 1,2-Dibromoethane, Fonofos, Isopropylbenzene, 1,2,3-Trichlorobenzene, Trifluralin

Water Quality Parameters (12/14/05)

pH (in pH units)	7.59	
Total Alkalinity (CaCO ₃)	144	ppm
Total Hardness (CaCO ₃)	160	ppm
(10 grains per gallon)		
Total Dissolved Solids	264	ppm
Calcium	47.1	ppm
Chloride	14	ppm
Iron	<0.05	ppm
Manganese	1.05	ppb
Sodium	23.9	ppm
Sulfate	39	ppm

Lincoln's water is moderately hard. Alkalinity, pH and hardness are important if considering a water softener.

Chloramine and Lincoln Water System Drinking Water

Chloramines have been used for water disinfection in the United States and Canada for many decades. They have been used since the 1930s by Lincoln Water System as a disinfectant for drinking water. While obviously toxic at high levels, just like salt, neither pose health concerns to humans at the levels used for drinking water chloramines are very safe. In humans and most pets, chloramines are neutralized naturally by the digestive system before they reach the blood.

How safe are chloramines in water?

Chloramines have been used safely for many years. The Environmental Protection Agency (EPA) accepts chloramines as a disinfectant. Were it not for some type of disinfectant in drinking water, disease-causing organisms could be carried in the drinking water. Chloraminated water is safe for bathing, drinking, cooking and all uses that humans have for water every day.

Do I need to do anything to protect my fish?

Chloramines are toxic to fish (salt and freshwater) since water enters through the gill structure in fish and goes directly into the bloodstream. When in the bloodstream of fish, the chloramines bind to iron present in the red blood cells, making it difficult for the red blood cells to carry oxygen. Chloramines also are toxic to amphibians and reptiles. Ammonia in addition to chlorine can be released if chloramines are not properly removed. Ammonia can be toxic to fish, although fish produce some ammonia as a natural waste by-product. Products are available for the removal of chloramines that are effective on both chlorine and ammonia.

Won't letting water sit for a few days remove chloramines from tank or pond water?

No. Unlike chlorine, which dissipates when water sits for a few days, chloramines may take weeks to disappear, and steps should be taken to remove chloramines. Most pet stores have sold dechlorinating agents for years. Care should be taken to ensure that any chemical used for removing chloramines removes both chlorine and ammonia. If you do not wish to use dechlorinating chemicals, other options are available.

Where can I find dechlorinating agents or filters?

The local pet, fish or aquarium store should have different types of dechlorinators in stock. Several brands of neutralizers are listed on the Internet. Some common names are AmQuel(TM), Seachem Prime(TM), Tetra AquaSafe for Aquariums and Professional Ammonia Detox. Lincoln Water System does not recommend or support any of the listed products. The products are listed for reference information purposes only.

How much dechlorinating agent or what type of granular activated filter should be used?

Ask your local fish store, or general pet store or read the instructions on the container or equipment.

Will reverse osmosis remove chloramines?

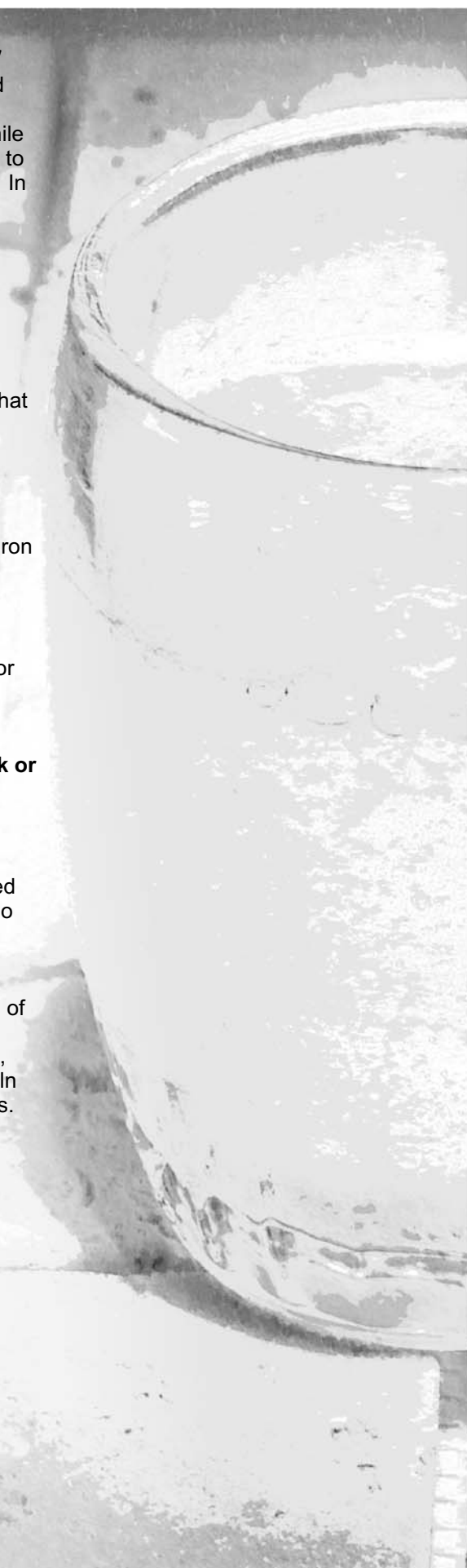
No. Salts can be caught by the permeable membranes, but chloramines pass through them.

Will chloramines be removed by boiling the water?

No.

Do home softeners remove chloramines?

Most home water softeners are NOT designed to remove chloramines.



SHOULD I TRY TO CONSERVE WATER?

It is always advisable to use water responsibly. Conserving water is a good idea for many reasons. Conserving water saves you money, protects the environment and preserves this precious natural resource.

More than half of the water we use in the summer goes to outdoor use for gardens, shrubs and lawns. Mayor Coleen J. Seng asked the community to conserve water in the landscape by using the voluntary designated day watering schedule. Those with addresses ending in an even number are asked to water on Wednesday, Friday and Sunday. Those with addresses ending in an odd number are asked to water on Tuesday, Thursday and Saturday.

There are many other ways to conserve water both indoors and outdoors, including the use of water-conserving plants. Recommended plants can be found in brochures developed by the Mayor's Water Conservation Task Force. Brochures can be obtained at local area nurseries. Visit the City's website at: lincoln.ne.gov (keyword: water) for other suggestions.

WERE IMPROVEMENTS MADE TO THE WATER SYSTEM LAST YEAR? WHAT IS PLANNED FOR THIS YEAR?

Lincoln Water System generates its revenue through water use fees collected when you pay your water bill. No property tax money is used in the operation, maintenance or construction of capital improvement projects for the water system.

This year's capital improvement budget totals \$14.1 million. Capital projects completed or nearly completed include modifications to a major pump station; replacement of two wells; replacement of the water main in the "O" Street widening project; installation of 3 miles of transmission main; and 3.2 miles of replacement water main in the distribution system.

New projects under way include siting and design of an elevated reservoir in Southeast Lincoln; design of a large diameter transmission main; and, construction on numerous distribution system mains for the continued growth of the community. In addition, more than \$2.6 million is allocated for the replacement of deteriorating water mains which have served their useful lives.

WHAT ELSE IS DONE TO PROTECT MY WATER?

The residential customer, the business customer and the commercial/industrial customer all share equally in protecting Lincoln's water. One way of doing this is through a "Cross Connection Control Program." A cross connection is any physical or potential connection between the drinking water supply and a source of possible contamination or pollution. The purpose of the program is to protect the drinking water supply system by either eliminating cross connections or installing approved backflow prevention devices to prevent the contamination from entering the drinking water supply.

Contaminants and pollutants can enter the drinking water supply when there is a sudden loss of pressure from heavy usage, a fire in the area or a broken water main. When that happens, contaminated water could be siphoned through the plumbing system into the public water mains. These pressure drops occur somewhere in the City almost every day. Backflow prevention devices are invaluable in preventing contaminants from entering the water supply in these situations.

Property owners/tenants have the responsibility to ensure that no cross connections exist on their property and that they are properly protected with an approved backflow prevention device. **Property owners/ tenants must have these devices tested annually to ensure proper, continuous operation.** A list of registered testers can be obtained from the Lincoln Water System by calling 402-441-5912. The cost of the test is the responsibility of the owner. For more information on the "Cross Connection Program," visit the City's Web site at: lincoln.ne.gov (keyword: water).

In addition, City ordinance requires the installation of backflow prevention devices on lawn irrigation systems. Even though State law does not require these devices to be tested, property owners are encouraged to have the devices tested annually to protect against contamination of the interior plumbing system.

Cross Connection Question and Answer:

Q: What is the most common form of cross connection?

A: Ironically it's the ordinary garden hose. It can easily be connected to the potable water supply and used for a variety of potentially dangerous applications.



Designed by CITIZEN INFORMATION CENTER 5/2006

WHAT DOES THIS INFORMATION MEAN?

As the regulations require, we routinely test your water for numerous contaminants. These include total coliforms, turbidity, inorganic contaminants, nitrate, nitrite, lead and copper, volatile organic contaminants, total trihalomethanes and synthetic organic contaminants. The contaminants found in Lincoln's water are shown on the test results table on the inside of this brochure. The State allows us to test for some contaminants less often than once per year when the concentrations of these contaminants do not change frequently. Therefore, some of this data may be more than one year old.

The presence of contaminants does not necessarily indicate a health risk. More information about contaminants and potential health effects can be obtained from EPA's Web site by calling the EPA hotline at 800-426-4791 or by calling the Lincoln-Lancaster County Health Department at 441-8000.

ARE THERE CONTAMINANTS IN OUR DRINKING WATER?

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and can pick up substances resulting from the presence of animals or human activities. Contaminants that may be present in source water include microbial contaminants, organic or inorganic contaminants, pesticides, herbicides and radioactive contaminants. To ensure that tap water is safe to drink, the EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Although a few contaminants such as atrazine, total trihalomethanes and arsenic were detected during testing, their concentrations were well below the levels to cause health concerns.

Atrazine is an herbicide used by farmers to kill weeds in corn and grain sorghum. Atrazine is applied to the fields at planting time. When it rains, atrazine is washed from fields and enters streams eventually finding its way into rivers.

The total trihalomethanes group includes four disinfection by-product chemicals formed when chlorine, which is added to the water to kill bacteria, reacts with naturally occurring organic matter in the water. The maximum level allowed is 80 parts per billion. It should be noted that any harmful health effects caused by disinfection by-products are small compared with the health risks associated with inadequate disinfection.

The Safe Drinking Water standard (MCL) for arsenic was 50 parts per billion (ppb) in 2005. It was lowered to 10 ppb in January 2006. While your drinking water meets EPA's standard, it does contain 7.23 ppb arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the cost of removing it from drinking water. EPA continues to research the health effects. It is known to cause cancer at high concentrations and other health problems such as skin damage and circulatory problems.

SPECIAL HEALTH REQUIREMENTS

While the presence of chloramines in our water is not a cause for concern among the general public, home dialysis patients, immuno-compromised individuals and aquarium owners must take special precautions before the water can be used.

For properly conditioned water for kidney dialysis equipment, make sure to contact your doctor or dialysis technician to ensure that your home equipment is adequate and proper tests are being made every time it is used.

Some people may be more vulnerable to contaminants in drinking water than the general population. This includes immuno-compromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune systems disorders, some elderly people and infants. These people should seek advice about drinking water from their health care providers.

TO LEARN MORE

For answers to questions you may have or to learn more about the water you drink, call Jerry Obrist at 441-7571. This report and other information about water is available on the City's Web site at: lincoln.ne.gov

If you would like to participate in the decision-making process, please contact the City Clerk to arrange to be placed on the agenda for the regularly scheduled Monday City Council meetings.